Editorial Comments JAMIA

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Policy and the Future of Adverse Event Detection Using Information Technology

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■ **J Am Med Inform Assoc.** 2003;10:226–28. DOI 10.1197/jamia.M1268.

In health care today, most adverse events are detected using spontaneous reporting, which identifies only a small number of adverse events.[1] This is probably the major reason that problems with patient safety have been overlooked until recently. However, information technology can be used in a variety of ways to detect adverse events continuously and relatively inexpensively. In an accompanying paper,[2] we review the methodologies for detecting adverse events using information technology and the evidence regarding their efficacy. This editorial presents some of what we believe are future possibilities in this domain and discusses policy issues regarding the development of strategies that may result in wider use of such tools.

Spontaneous reporting is attractive because it is inexpensive compared with other approaches for detecting adverse events. Events detected via this route can be useful for quality improvement. However, because reported events represent only a tiny fraction of all adverse events that occur, absolute rates of spontaneous reporting or changes in them are not particularly useful, except to assess safety culture or whether strategies to improve reporting have worked.[3] In contrast, a variety of information tchnology approaches can be used to identify a large proportion of all adverse events that occur,[4] and this pro-

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Received for publication: 10/14/02; accepted for publication: 10/29/02.

portion can be expected to increase as more electronic data become available and tools are refined.

Future Needed Work

Although the data regarding automated detection of some types of adverse events are now substantial,[5–9] many research and development issues remain to be addressed. For nosocomial infections, adverse drug events and falls, there is a major need for studies that compare different approaches to detection and identify methods that will improve the positive predictive value (which is generally low) for individual signals. This is important because the major cost of such detection strategies is the time of the personnel who respond to the signals. Another key research area involves the definition of approaches that will allow exportation of such detection modules to hospitals in general and to small rural and community hospitals in particular. Finally, tools that allow detection of a wide array of adverse events are needed. Although claims data can provide limited information, especially for inpatients, they do not include sufficient detail to identify a large proportion of adverse events.[10] A key benefit of electronic medical records may be that it will be possible to search them using computerized detection tools. Such approaches appear promising based on early data,[11] but they need much more evaluation with respect to performance and generalizability. Finally, standards regarding definitions and representation of adverse events would be useful, as would better tools for classifying what went wrong in preventable events.

Policy Issues

Patient safety is extraordinarily important to the public, but the policy issues around adverse event detection and malpractice are nettlesome. Unfortunately, given the current structures of health care in the U.S., there are strong incentives for organizations to turn a blind eye to adverse events. In particular, serious, preventable adverse events typically must be reported to the state, and such events often lead to multiple visits from the department of public health or end up in the press, with adverse consequences for the institution. Thus, adverse events have negative connotations to many, and our current system offers few incentives to organizations to look for them aggressively. In particular, those who ultimately must approve resources for monitoring systems (chief executive officers and chief operating officers) can avoid investing in them, especially since there are so many competing demands for funds.

As a result, financial incentives or regulation may be needed to achieve widespread adoption of routine automated monitoring for adverse events. Several years ago the Centers for Medicare and Medicaid Services (the former Health Care Financing Administration) published draft regulations in the Federal Register that would have mandated computerized monitoring of adverse drug events in inpatients.[12] These regulations had a number of unrelated problems, and are undergoing revision. We believe that setting up incentives for hospitals to monitor both adverse drug events and nosocomial infections using computerized detection would be desirable now. Eventually, health care systems should look routinely for adverse events using computerized detection approaches both inside and outside of hospitals, but they will not take on this burden without incentives. Incentives may come in the form of carrots (e.g., higher reimbursement for compliant organizations) or as sticks (e.g., making such monitoring a condition of participation). Another enabler is for the government to make monitoring tools available; the Center for Medicare and Medicaid Services is currently considering this possibility.

A related issue that must be addressed is how individuals and organizations that identify and improve their systems using error and adverse event detection should be treated. Although this issue is complicated, the current "blame-and-shame" approach is highly counterproductive. In aviation, nonpunitive approaches have been highly effective in determining the causes of adverse events and developing strategies and interventions for prevention.[13]

Conclusions

If good techniques for identifying adverse events are developed and used broadly, it will be possible to use such information to improve safety in an ongoing way and, in particular, to use it to assess the impact of systemic changes. We believe that achieving widespread adoption of these techniques may require regulation, because such screening requires resources and organizations are justifiably fearful that uncovering problems may increase litigation risk. However, if legislation or regulations were enacted to provide better protection for health care organizations, substantial improvement in patient safety may result.

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